

# ACADEMIC, INTELLECTUAL SKILLS PERFORMANCE AND STRATEGIES OF LEARNING IN UNIVERSITY STUDENTS OF LIMA

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## ABSTRACT

It explores the relationship between primary mental aptitudes, triarchic intelligence, learning strategies and academic performance in college. The sample was 231 psychology students, from the 1st to the 4th cycle, of a private University in Lima. The following tests were used: Primary Mental Aptitudes (PMA, 1936, 1996, 1997), Triarchic intelligence (STAT, 1985, 2000), level h, and Study and Learning Strategies (LASSI, 1987, 2002). It was considered the overall average of the semester 07-II for academic performance. The Multiple Correlation Coefficient of Pearson and the Linear Regression was used. Positive and significant relations between the studied variables were found; however, variables that predict academic performance are the analytic intelligence and the motivational component (attitude, motivation and anxiety).

**Key words:** Primary mental aptitudes, triarchic intelligence, strategies for learning, academic performance, psychology students, university

## Introduction

The Peruvian University system is characterized by serious deficiencies that are reflected in the academic performance of students. These shortcomings are not started in the upper formation but become basic training (e.g., Programme for Indicators of Student Achievement, PISA, Organización para la Cooperación y Desarrollo Económico, OCDE - UNESCO, 2003; IV Evaluación Nacional de Rendimiento Estudiantil, 2001, citado en UMCE - MERP, 2004), and sharpened at the University, due to the increase of the complexity of the academic activities (e.g., Thorne, 2000; Trahtemberg, 2006). There are several factors associated with academic performance; this study focuses on those factors that have been shown empirically to be associated to academic performance, such as intelligence and learning strategies (e.g., Cano, 2006; Escalante & Rivas, 2002; Martinez & Galan, 2000; Schmeck & Grove, 1979; Van Den, 2006).

Regarding intelligence, their different definitions share common elements such as the importance of the adaptation to the environment and the ability to learn. However, this construct still is not clearly specified and intelligence tests do not include tasks of adaptation like those that one must face on a daily basis, nor are they dynamic tests that require learning during the implementation of the instrument. Rather, traditional tests focus on the measurement of prior learning, which can be the result of different factors, including motivation and opportunities for teach (Sternberg, Grigorenko & Kidd, 2005).

Most of the theories that converge in the psychometric approach focus on factor «g» of intelligence (Sanz de Acedo, 1998). Sternberg, Castejon, Prieto, Hautamäki, and Grigorenko (2001), recognize the empirical validity of this factor, but believe that its generality is limited to measuring

academic skills. As a result, they do not provide complete information on cognitive abilities and neglect important aspects which put at a disadvantage many individuals, such as the influence of the education and culture in the performance and development of intelligence (Sternberg, 1985).

Then, arises, the multiple intelligences approach. However in this approach some theories emphasize the quantitative value of the factors as the multifactor theory of the intelligence of Thurstone (1938); While others as the Triarchic theory of the intelligence of Sternberg, prioritize the process rather than the product (Sanz de Acedo, 1998).

For Thurstone (1938, cited in Sanz de Acedo, 1998) the intelligence is a set of independent primary factors (mental skills) that would explain the intellectual functioning with more accuracy than a general factor. The identified skills were: verbal comprehension, verbal fluency, numerical calculation, inductive reasoning and spatial visualization (Sanz de Acedo, 1998). However, subsequent research showed that although these primary capabilities did not include «g», this factor was extracted from these skills (Anderson, 1992, quoted in Sanz de Acedo, 1998).

On the other hand, Sternberg (1985) emphasizes the study of the internal processes (coding, storage, recovery and combination of information) that allow to give intelligent answers to the demands of the middle (Puente, Poggioli & Navarro, 1989). Taking into account the contextual and social factors as well as the human skills (Li, 1996, cited in Paick, 2007). For Sternberg, theories preceding him were incomplete because they only evaluate the analytical (or academic) intelligence and considered also the practical and creative intelligence (Neisser et al., 1996, cited in Paick, 2007; Sternberg et al., 2005).

In this way, Sternberg (2006) introduces the term successful intelligence, characterized by four aspects. First, the ability to achieve success in life depending on personal standards and the socio-cultural context to which the subject belongs. Second, the ability to be successful requires capitalizing on strengths and correct or compensate for weaknesses. Third, required a balance of skills to adapt, shape and select environments. Finally, success is achieved through the balance of three aspects of intelligence: analytical, creative and practical ability in all contexts of our life (work, relationships, home, etc.).

Analytical intelligence (componential) specifies the mental mechanisms responsible for the planning, implementation and evaluation of intelligent behavior facing the relatively familiar problems or requiring abstraction, similar to the academic activities (Sternberg, 2006; Sternberg et al., 2001). It includes three components: meta-components, runtime components and acquisition components (Sternberg et al., 2001). Creative intelligence (experiential)

is the ability to face new tasks; implies a continuum ranging from a new situation to another fully automated for the subject (Sternberg et al., 2001); includes three processes: selective encoding, selective combination and automation. And practical intelligence (contextual) is the ability of the subject to solve arising problems on a daily basis at work or at home (Sternberg, 2006; Sternberg et al., 2001); includes three processes: adaptation, the environmental transformation and selection of the environment (Puente et al., 1989; Sanz de Acedo, 1998; Sternberg, 2006).

In addition, only the analytical intelligence is measured significantly by conventional tests. Even the practical knowledge is relatively independent of the intelligence or achievement test scores; however it correlates positively with various performance indexes of labor (Sternberg & Wagner, 1993; Sternberg et al., 1995, cited in Universidad Nacional Mayor de San Marcos, 1997; Sternberg, 2006).

On this theoretical conception, Sternberg built the Triarchic Abilities Test (STAT), which seeks to assess, in addition to analytical intelligence, creative and practical intelligence. Based on this proposal it has been done some research with interesting results. Carrasco (2002) found that academic performance presents a moderate but significant positive correlation with analytical intelligence (.40) and the figural domain (.38). The relationship with the analytical intelligence is consistent with the proposed by Sternberg; while the relationship with the figural domain might be factor *g*. Likewise, analytical intelligence and the quantitative domain improve when the parents of the students are university graduates. Finally, the results of the analytical intelligence vary according to the school of origin, obtaining the best results schools classified as «good schools»; as well as comparatively, the students from a school in the province are at a disadvantage with respect to those which did not study in the capital, Lima.

















self-assessment) showed significant positive bivariate correlation, with a greater than .20 correlation coefficient and greater than .89 statistical power (Table 1). But in the linear regression model it only appears as a predictor variable of academic performance, motivation component which includes attitude, motivation and anxiety scales, which explained the 9.9% of the variance in academic performance.

Also at the University level, many researchers have shown that motivation and learning strategies can be influenced by characteristics of the context of learning, such as the contents of the course or assessment (Entwistle, McCune, & Walker, 2003; Entwistle & Ramsden, 1983; Gow & Kember, 1990 cited in Cano, 2006). Students tend to use surface approaches to learning (extrinsic motivation and rote learning), because they are adapted to the new institutional requirements (e.g. demanding curricula, pressure for the academic work, assessment procedures) (Biggs, 1987; Gow & Kember, 1990; Kember, 2000, cited in Cano, 2006).

This is especially true in the first academic cycles, where students must go through a process of adaptation to the requirements of higher education, which leads to a higher degree of awareness and use of affective strategies. Polo, Hernandez and Pozo (1996), found that students who enter for the first time to the University present a higher level of stress, due to the need to adopt a range of coping strategies that are very different from those that had up to that time to adapt to the new environment. However, the academic requirement and work habits acquired at lower educational levels, not always help the natural adaptation of the student to the University level.

Among the main causes of stress in the University students are the examinations, academic overload and lack of time to comply with the academic activities (Celis et al., 2001).

So it is that the population of this study, which studied the first cycles of the race, is in a process of adaptation, in

a context characterized by a high level of academic requirement, numerous studies and evaluations, and strict rules, that in addition to the lack of cognitive resources, leads students to prioritize the use of affective strategies, even on cognitive strategies.

On the other hand, the learning process starts with awareness. Before acquiring the information it is necessary that the student feels motivated, keeps a favorable predisposition towards the study and adjusts their anxiety (Beltran, 1998).

In addition, Justice and Dornan (2001) argue that the few significant relationships and negative correlations between the use of learning strategies and academic achievement in a research conducted may also be due to lack of experience (early stage in the employment of a new strategy) in the effective use of these.

Finally, Martinez and Galan (2000), found that there is a significant relationship between the learning strategies and the results of the formative evaluation (during the development of the subject), but not with the final evaluation. Apparently the final evaluation (in this study the average) does not assess the strategies employed by the students. The authors suggest that the evaluation focused on the product should be replaced by a process-oriented evaluation. We also found that the use of strategies was affected by the characteristics of the courses and the types of tests (Curley et al., 1987; Weiss & Rohwer, 1986, cited in Justice & Dornan, 2001).

It seems, therefore, that the relationship between the learning strategy and academic performance is mediated by the relationships between academic performance and another set of independent variables (Cano, 2006). Among these variables are considered characteristics of the University, of course, of teachers, of the system of assessment and the student.

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